

## **REMARKS**

Claims 1-12, 22 and 23 are currently pending in the application. Claims 13-21 have been canceled as directed to a non-elected invention. Claims 1-12, 22 and 23 are also canceled herein. Claims 1-23 are canceled without prejudice to Applicant's right, and Applicant reserves the right, to prosecute the subject matter of these claims in a related application. New claims 24-43 are added. Support for new claims 24-43 is found in the specification at least as follows:

- 24              Summary of the Invention; pages 7-15; page 16, lines 7-22;
- 25              Pages 14-15;
- 26              Pages 7-8;
- 27              Pages 7-14;
- 28              Page 7, line 28 to page 8, line 3;
- 29              Page 4, lines 7-11; page 28, lines 13-18;
- 30              Page 4, lines 7-11; page 28, lines 13-18;
- 31              FIG. 4;
- 32              Page 16, lines 13-15;
- 33              Page 16, lines 13-15;
- 34              Page 16, lines 13-15;
- 35              Page 12, line 24-page 13, line 28;
- 36              Page 13, lines 9-28;
- 37              Page 13, lines 22-25;
- 38              Page 13, lines 25-28;
- 39              Page 3, lines 7-9;
- 40              Page 3, lines 7-9;
- 41              Pages 14-15;
- 42              Pages 7-14;
- 43              Page 13, lines 25-28.

No new matter is introduced by new claims 24-43.

## **Attorney Docket Number**

Please note that the Attorney Docket Number for this application is now 9516-101-999. Please reference this docket number in future communications regarding this application. (The number in the header of this paper labeled "CAM" is an internal firm reference number, and not the Attorney Docket Number.)

## **Claim Objections**

The Examiner has objected to claims 4-10 because of the recitation of the word “including.” Applicant has canceled claims 4-10.

The Examiner has further objected to claims 22 and 23 for recitation of the word “including.” Applicant has canceled claims 22 and 23.

## **The Rejection Under 35 U.S.C. § 112, ¶ 2 Should Be Withdrawn**

The Examiner has alleged that claims 1-12, 22 and 23 are vague and indefinite under 35 U.S.C. § 112, second paragraph because claim 1 requires seeding embryonic stem (“ES”) cells in a tissue matrix, “but since most ES cells would be differentiated as soon as they are seeded, it is unclear what cell *component* and *status* the ‘seeded tissue matrix’ comprises, *e.g.*, ES cells only or a specific type of differentiated cells.” Office Action, page 3 (emphasis in original). Applicant has canceled claims 1-12, 22 and 23; thus, the Examiner’s rejection of these claims is moot. Applicant traverses, however, with respect to the basis of the rejection.

The standard for clarity and definiteness of a claim is whether the language of a claim reasonably apprises one of skill in the art of the claim’s scope such that the claim serves its notice function. See Manual of Patent Examining Procedure (M.P.E.P.) 2173.02, *citing Solomon v. Kimberly-Clark Corp.* 216 F.3d 1372, 1379 (Fed. Cir. 2000). Claim 1 as originally filed is sufficiently definite because a person of skill in the art would know what types of cells to seed onto a tissue matrix, and the source of those cells. The Examiner’s concern that “most ES cells would be differentiated as soon as they are seeded” (an assertion for which the Examiner provides no basis) is not relevant to whether a person of skill in the art would understand the scope of the method steps recited in the claim. The Examiner further objects to claim 2 as reading on seeding the tissue matrix with ES cells and other cell types, contending that “[i]t is unclear what type of tissue matrix the claims are intended to make . . .” (Office Action at page 3). Again, it is clear that the tissue matrix made according to the claim is one seeded with residual cells in the perfusion liquid of the placenta. For both claim 1 and claim 2 as filed, therefore, it is clear that the tissue matrix being made is one seeded with ES cells.

By the same token, new claim 24 is sufficiently definite in its recitation of a method of manufacturing a tissue matrix by “seeding stem cells from a mammalian placenta into or onto a tissue matrix.” Again, the metes and bounds of the claims are clear because a person of skill in the art would understand exactly how to avoid infringement of the claims. For

example, a person of skill in the art would understand that to obtain stem cells from *cord blood* and seed them onto a tissue matrix would not infringe, but to obtain stem cells from a *placenta* and seed them into a tissue matrix would infringe. Thus, the claims are sufficiently definite.

The Examiner further rejects claim 2 as “vague and indefinite because the sequential timing of the claimed steps is unclear.” Office Action, page 3. Applicant has canceled claim 2.

The Examiner has rejected claims 4 for lack of antecedent basis for the limitation “the placenta.” Applicant has canceled claim 4.

The Examiner has rejected claims 1-10 under 35 U.S.C. § 112, second paragraph, as allegedly incomplete for omitting missing elements. Applicant has canceled claims 1-10, but traverses with respect to the basis for the Examiner’s rejection. In particular, the Examiner contends that “[t]he omitted elements are: identification of embryonic stem cells.” Office Action, page 4. The Examiner does not explain why this is deemed a missing step. Moreover, the Examiner contends that “centrifugation does not appear to be able to separate ES cells from residual cells.” The Examiner provides no basis for this assertion. Applicant respectfully suggests that these contentions are not adequate bases for a finding of indefiniteness.

Finally, the Examiner has rejected claims 22 and 23 as indefinite in the recitation of “before seeding said collected stem cells onto or into a tissue matrix, stimulating said placenta with exogenous cells.” Applicant has canceled claims 22 and 23.

#### **The Rejection Under 35 U.S.C. § 112, ¶ 1 Should Be Withdrawn**

The Examiner has rejected claims 1-12, 22 and 23 under 35 U.S.C. § 112, first paragraph, as lacking written description support in the specification. Office Action, page 5. Applicant has canceled claims 1-12, 22 and 23, but traverses with respect to the Examiner’s bases of rejection, to the extent they apply to new claims 24-43.

First, applicant notes that the specification, and new claims 24-43, are directed to stem cells obtained from a mammalian placenta, and not embryonic stem cells.

The specification teaches that these stem cells, derived from a mammalian placenta, may be SSEA3<sup>-</sup>, SSEA4<sup>-</sup> and Oct-4<sup>+</sup>. Page 28, lines 13-15. Thus, the specification teaches that certain placental stem cells of the invention *lack* the markers SSEA3 and SSEA4. The specification at page 28, line 15 further identifies certain placental stem cells as being ABC-p<sup>+</sup>. ABC-p is a placenta-specific marker. See Lorkowski & Cullen, “ABCG Subfamily of Human ATP-Binding Cassette Proteins,” *Pure Appl. Chem.* 74(11):2057-2081 (2002)

(“Lorkowski”), particularly pp. 2057 (abbreviations) and 2068, last full paragraph. A copy of Lorkowski is attached hereto. Moreover, the next paragraph in the specification further defines certain placental stem cells as CD10<sup>+</sup>, CD29<sup>+</sup>, CD34<sup>-</sup>, CD44<sup>+</sup>, CD45<sup>-</sup>, CD54<sup>+</sup>, CD90<sup>+</sup>, SH2<sup>+</sup> and SH4<sup>+</sup>. Thus, the particular population of cells encompassed by the claims is well-described.

The Examiner cites Pera *et al.*, *J. Cell Sci.* 113:5-10 (2000) in support of the contention that “these markers [*i.e.*, SSEA3<sup>-</sup>, SSEA4<sup>-</sup> and Oct-4<sup>+</sup>] alone cannot confirm the identity of ES cells.” Office Action, page 6. Pera *et al.* discusses only embryonic stem cells, and does not discuss the identifying characteristics of placental stem cells. This reference, therefore, is not relevant to new claims 24-43.

In a related rejection, the Examiner rejects claims 1-12, 22 and 23 under 35 U.S.C. § 112, first paragraph, as allegedly nonenabled. Applicant has canceled claims 1-12, 22 and 23, but traverses as to the Examiner’s bases of rejection.

The Examiner contends that “the specification fails to provide an adequate description for the purposed [*sic*] ES cells encompassed by the claims.” Office Action, page 9. Thus, the Examiner bases the nonenablement rejection, as the written description rejection, on an alleged lack of description of the particular cells recited in the claims.

New claims 24-43 do not encompass the use of embryonic stem cells. Moreover, the specification fully describes the placental stem cells recited in claims 24-43. *See above.* Thus, because the placental stem cells of the invention are adequately described in, and supported by, the specification, new claims 24-43 are enabled by the specification.

#### **The Rejection Under 35 U.S.C. §§ 102(e)/103(a) Over Anderson Should Be Withdrawn**

The Examiner has rejected claims 11 and 12 under 35 U.S.C. § 102(e) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, Anderson *et al.*, United States Patent No. 6,328,762 (“Anderson”). Applicant traverses.

For a reference to anticipate a claim, the reference must disclose each and every limitation of the claim to which it is compared. *Schumer v. Laboratory Computer Sys., Inc.*, 308 F.3d 1304 (Fed. Cir. 2002); *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292 (Fed. Cir. 2002). An allegedly anticipating reference must also enable the invention embodied in the anticipated claim. *Elan Pharmaceuticals, Inc. v. Mayo Found. for Medical Education and Research*, 304 F.3d 1221, 1227-28 (Fed. Cir. 2003), *citing Crown Operations Int’l, Ltd. v. Solutia, Inc.*, 289 F.3d 1367, 1375 (Fed. Cir. 2002) and *In re Spada*, 911 F.2d 705, 708 (Fed. Cir. 1990) (“the reference must describe the applicant’s claimed invention sufficiently to have placed a person of ordinary skill in the field of the invention in possession of it.”).

To establish a case of *prima facie* obviousness, the Examiner must meet three basic criteria: first, there must have been at the time of the invention a motivation to combine the references cited; second, the alleged prior art must teach or suggest all of the limitations of the claims alleged to be obvious; and third, there must have been at the time of the invention a reasonable expectation of success. M.P.E.P. § 2142. Furthermore, hindsight cannot be used to reject a claim as obvious. M.P.E.P. § 2141.01. Consequently, when determining whether or not a claimed invention is obvious, one must cast his or her “mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field.” *In re Dembicza*k, 175 F.3d 994, 999 (Fed. Cir. 1999).

Applicant has canceled claims 1-12, 22 and 23. Thus, the Examiner’s rejection of these claims over Anderson is moot. With respect to new claims 41-43, the claimed tissue matrix is not described or suggested by Anderson. Claims 41-43 are directed to a tissue matrix comprising stem cells derived from a mammalian placenta. Such a tissue matrix is not described by Anderson. Anderson allegedly teaches the use of adherent cells, such as fibroblasts, mesenchymal stem cells, and bone marrow stem cells. *See, e.g.*, col. 3, lines 7-12. Anderson does not teach or suggest a tissue matrix comprising placenta-derived stem cells; indeed, it fails to mention placental stem cells at all. Moreover, Anderson does not enable a tissue matrix comprising placenta-derived stem cells; for example, the reference fails to describe where or how such stem cells may be obtained. This is not surprising, because Applicant was the first to describe methods of obtaining stem cells from a mammalian placenta. Because Anderson does not teach all limitations of the claimed tissue matrix, and because it does not enable the claimed tissue matrix, Anderson does not anticipate claims 41-43 under 35 U.S.C. § 102(e).

For the same reasons, the claimed tissue matrix is not obvious over Anderson. Additionally, Anderson provides no teaching or motivation to create a tissue matrix comprising placental stem cells. Reading Anderson, persons of skill in the art would not be motivated to construct the tissue matrix taught therein using stem cells from a mammalian placenta because they would not be aware such cells existed. By the same token, Anderson fails to provide a reasonable expectation of success in creating such a tissue matrix, because it fails to teach the use of placental stem cells in a tissue matrix. Thus, the claimed tissue matrices are not obvious under 35 U.S.C. § 103(a) over Anderson.

### **The Rejection Under 35 U.S.C. §§ 102(e)/103(a) Over Wu Should Be Withdrawn**

The Examiner has rejected claims 11 and 12 under 35 U.S.C. § 102(e) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, Wu *et al.*, United States Application Publication No. 2003/0109042 (“Wu”). Applicant traverses.

Applicant has canceled claims 1-12, 22 and 23. Thus, the Examiner’s rejection of these claims over Wu is moot. With respect to new claims 41-43, the claimed tissue matrix is not described or suggested by Wu. Claims 41-43 are directed to a tissue matrix comprising stem cells derived from a mammalian placenta. Such a tissue matrix is not described by Wu. Wu purportedly teaches the use of “hemopoietic stem cells,” defined to include “bone marrow stem cells, peripheral stem cells, embryonic stem cells, umbilical blood stem cells and other types of stem cells.” Wu, Paragraph 73. This alleged teaching notwithstanding, Wu does not teach or suggest a tissue matrix comprising placenta-derived stem cells, and thus fails to teach this limitation of claims 41-43. Moreover, Wu does not enable a tissue matrix comprising placenta-derived stem cells; the reference fails to describe where or how such stem cells may be obtained. Indeed, Wu fails to mention placental stem cells at all. This is not surprising, because Applicant was the first to describe methods of obtaining such cells. The mere reference in Wu to the use of “any stem cells” does not substitute for a teaching of the use of placental stem cells, as in the instantly-claimed invention. Because Wu does not teach all limitations of the claimed tissue matrix, and because it does not enable the claimed tissue matrix, Wu does not anticipate claims 41-43 under 35 U.S.C. § 102(e).

For the same reasons, the claimed tissue matrix is not obvious over Wu. Additionally, Wu provides no teaching or motivation to create a tissue matrix comprising placental stem cells. Reading Wu, persons of skill in the art would not be motivated to construct the tissue matrix taught therein using stem cells from a mammalian placenta because they would not be aware such cells existed. Nor does Wu provide a reasonable expectation of success in creating such a tissue matrix, because it fails to teach the use of placental stem cells in a tissue matrix. Thus, the tissue matrices of claims 41-43 are not obvious under 35 U.S.C. § 103(a) over Wu.

### **The Rejection Under 35 U.S.C. §§ 102(a)/103(a) Over Buttery Should Be Withdrawn**

The Examiner has rejected claims 11 and 12 under 35 U.S.C. § 102(a) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over, Buttery *et al.*, *Tissue Engineering* 7(1):89-99 (2001) (“Wu”). Applicant traverses.

Applicant has canceled claims 1-12, 22 and 23. Thus, the Examiner’s rejection of these claims over Buttery is moot. With respect to new claims 41-43, the claimed tissue

matrix is not described or suggested by Buttery. Claims 41-43 are directed to a tissue matrix comprising stem cells derived from a mammalian placenta. Such a tissue matrix is not described by Buttery. Buttery allegedly teaches culture of a mouse embryonic stem cell line on a layer of embryonic feeder cells (page 90, last paragraph) and co-culture of mouse embryonic stem cells and fetal osteoblasts on tissue culture inserts (page 91, third paragraph). As such, Buttery does not teach or suggest a tissue matrix comprising placenta-derived stem cells, and thus fails to teach this limitation of claims 41-43. Moreover, Buttery, which appears to focus solely on ES cells, does not enable a tissue matrix comprising stem cells derived from a mammalian placenta; the reference fails to describe where or how such stem cells may be obtained. Indeed, the reference fails to mention placental stem cells at all. This is not surprising, because Applicant was the first to describe methods of obtaining such cells. Because Buttery does not teach all limitations of the claimed tissue matrix, and because it does not enable the claimed tissue matrix, Buttery does not anticipate claims 41-43 under 35 U.S.C. § 102(a).

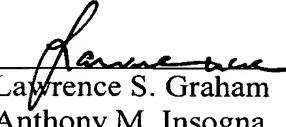
For the same reasons, the claimed tissue matrix is not obvious over Buttery. Additionally, Buttery provides no teaching or motivation to create a tissue matrix comprising placental stem cells. Nor does Buttery provide a reasonable expectation of success in creating such a tissue matrix, because it fails to teach the use of placental stem cells in a tissue matrix. Thus, the tissue matrices of claims 41-43 are not obvious under 35 U.S.C. § 103(a) over Buttery.

### CONCLUSION

Applicant respectfully requests that the above remarks and accompanying documents be entered in the present application file. An early allowance of the present application is respectfully requested. No fee is believed due for this Amendment. However, if any fee is deemed to be due, please charge such fee to Jones Day Deposit Account No. 503013.

Respectfully submitted,

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